ANIMAL KINGDOM

Contents

Syllabus

ANIMAL KINGDOM

Protozoans, Animal Kingdom Evolutionary Trends, A Phylogenetic Tree of Animal Kingdom, Phylum, Vertebrata, Salient features of different Phyla in the animal kingdom (Table), Difference between Chordates and Non-chordates

Name : _____ Contact No. _____

ZOOLOGY

4 - **Animal Kingdom**

CLASS : XI

PROTOZOANS

- All protozoans are heterotrophs and live as predators or parasites. They are believed to be primitive relatives of animal. There are four major groups of protozoans.
- **Amoeboid protozoans :** These organisms live in fresh water, sea water or moist soil. They move and capture their prey by putting out pseudopodia (false feet) as in Amoeba. Marine forms have sillica shells on their surface. Some of them such as Entamoeba are parasites.
- **Flagellated protozoans :** The members of this group are either free-living or parasitic. They have flagella. The parasitic forms cause diaseases such as sleeping sickness. Example : *Trypanosoma*
- **Cilated protozoans :** These are aquatic, actively moving organisms because of thepresence of thousand of cilia. They have a cavity (gullet) that opens to the outside of the cell surface. The coordinated movement of rows of cilia causes the water laden with food to be steered into the gullet.

  Example : *Paramoecium.*
- **Sporozoans :** This includes diverse organisms that have an infectious spore-like stage in their life cycle. The most notorious is Plasmodium (malarial parasite) which causes malaria which has a staggering effect on human population.

ANIMAL KINGDOM EVOLUTIONARY TRENDS

1. Animals show 3 structural levels : Cellular level (Porifera), tissue level (Coelenterata), and organ-system level (Platyhelminthes to Chordata).
2. Animal bodies have 4 kinds of symmetry: Spherical (egg), Radial (Hydra), Biradia! (Combjelly), and bilateral (Frog, Rat).
3. Most animals develop from 3 germ layers: Ectoderm, Mesoderm and Endoderm.
4. Flatworms are acoelomates, roundworms are pseudocoelomates, other animals above nematodes are coelomates.
5. Most animals are unisexual. Some are bisexual (liverfluke, earthworm).
6. Digestive tract is incomplete in Coelenterata to Platyhelminthes, and complete in all other phyla.
7. Respiration in animals may be body surface (Hydra), branchial (Prawn), pulmonary, tracheal (Insects), or cutaneous (earthworm).
8. Circulatory system is open in Arthropoda and Mollusca and closed in Annelida and Chordata.
9. Animals have a variety of excretory organs: Flame cells (liverfluke), intracellular tubules (Roundworms), nephridia (Earthworm), malpighian tubules (Insects), antennary (Crustaceans), kidneys (vertebrates). .
10. Most animals have head, appendages, skeleton and nervous system.

Outline ofAmiinal Classification

Kingdom → **Animal kingdom**
Animalia

(level of organisation)

Protozoa
(Protoplasmic level)

Metazoa
(Cellular/tissue/organ level)

cellular level

Mesozoa

Dicyemida
e.g.dicyema
(minute wormlike parasite
of marine invertebrate)

Parazoa

Porifera
(Cellular level)

Eumetazoa/Enterozoa

Tissue and organ system

Summetry

Radiata

Diploblastic
Tissue level

(i) Coelenteratia-Hydra
(ii) Ctenophora-Beroe (Triploblastic)

Bilateria

Tiploblastic
Organ system level

Embryonic development

Protostomous

Deuterostomous

Eucoelomata

Enterocoel — Echinodermata, Hemichordata, Chordata

Coelom

Acoelomata

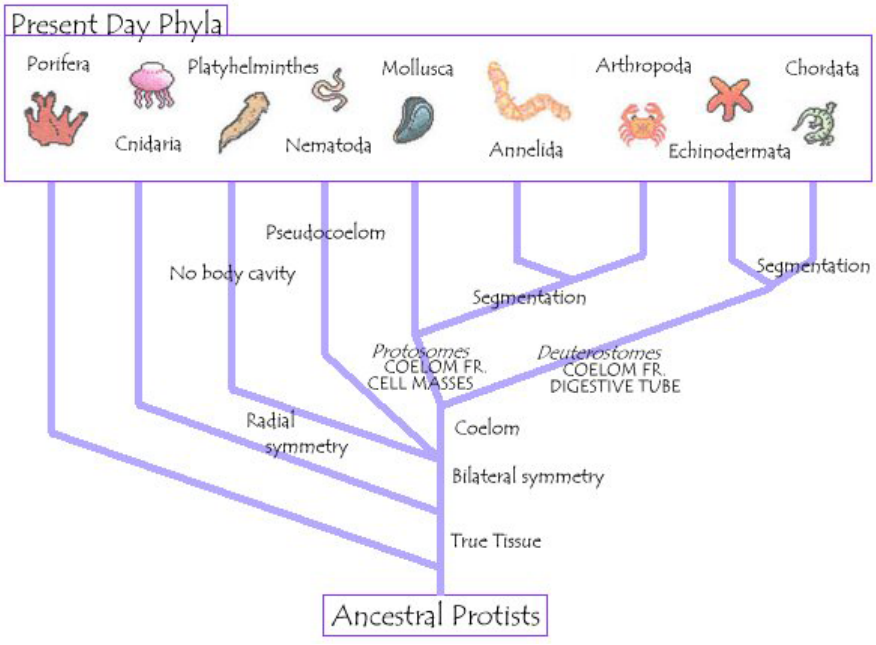
e.g. Platyhelminthes

Pseudocoelomata

Nemathelminthes
(Nematoda)

Eucoelomata

Schizocoel — Annelida, Mollusca, Arthopoda — Haemocoel



A phylogenetic tree of the animal kingdom

PHYLUM-PORIFERA

- Members of this phylum are commonly known as sponges. They are generally marine and mostly asymmetrical. animals. These are primitive multicellular animals and have cellular level of organisation.
- Sponges have a water transport or canal system. Water enters through minute pores (ostia) in the body wall into a central cavity, spongocoel, from where it goes out through the osculum. This pathway of water transport is helpful in food gathering, respiratory exchange and removal of waste. Choanocytes or collar cells line the spongocoel and the canals.
- Digestion is intracellular. The body is supported by a skeleton made up of spicules or spongin fibres.
- Sexes are not separate (hermaphrodite), i.e., eggs and sperms are produced by they some individual. Sponges reproduceasexually by fragmentauon and sexually by formation of gametes. Fertilisation is internal and development is indirect having a larval stage which is morphologically distinct from the adult.
- Examples: Sycon (Scypha), Spongilla (Fresh water sponge) and Euspongia (Bath sponge).

PHYLUM - COELENTERATA(CNIDARIA)

- They are aquatic, mostly marine, sessile or free-swimming, radially symmetrical animals.
- The name cnidaria is derived from the cnidoblasts or cnidocytes (which contain the stinging capsules or nematocytes) present on the tentacles and the body.
- Cnidoblasts are used for anchorage, defense and for the capture of prey.
- Cnidarians exhibit tissue level of organisation and are diploblastic. They have a central gastro-vascular cavity with a single opening, hypostome. Digestion is extracellular and intracellular.
- Some of the cnidarians, e.g., corals have a skeleton composed of calcium carbonate. Cnidarians exhibit two basic body forms called polyp and medusa . The former is a sessile and cylindrical form like Hydra, Adamsia etc. whereas, the latter is umbrella-shaped and free-swimming like Aurelia or jelly fish. Those cnidarians which exist in both forms exhibit alternation of generation (Metagenesis), i.e., polyps produce medusae asexually and medusae form the polyps sexually (e.g., Obelia).
- Examples: *Physalia* (Portuguese man-of-war), *A damsia (Sea* anemone), *Pennatula* (Sea-pen), *Gorgonia* (Sea-fan) and *Meandrina* (Brain coral).

PHYLUM - CTENOPHORA

- Ctenophores, commonly known as sea walnuts or comb jellies **are** exclusively marine, radially symmetrical, diploblastic Organisms with tissue level of organisation. The body bears eight external rows of ciliated comb plates, which help in locomotion.
- Digestion is both extracellular and intracellular.
- Bioluminescence (the property of a living organism to emit light) is well-marked in ctenophores.
- Sexes are not separate. Reproduction takes place only by sexual means. Fertilisation is external with indirect development.
- Examples: *Pleurobrachia* and *Ctenoplana.*

PHYLUM -PLATYHELIVIINTHES

- They have dorso-ventrally flattened body, hence are called flatworms .These are mostly endoparasites found in animals including human beings.
- Flatworms are bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organisation.
- Hooks and suckers are present in the parasitic forms. Some of them absorb nutrients from the host directly through their body surface.
- Specialised cells called flame cells help in osmoregulation and excretion.
- Sexes are not separate. Fertilisation is internal and development is through many larval stages. Some members like *Planaria* possess high regeneration capacity.
- Examples: *Taenia* (Tapeworm), *Fasciola* (Liver fluke).

PHYLUM-ASCHELM1NTHES

- The body of the aschelminthes is circular in cross-section, hence, the name roundworms. They may be free-living, aquatic and terrestrial or parasitic in plants and animals.
- Roundworms have crgan-system level of body organisation. They are bilaterally symmetrical, triploblastic and pseudocoelomate animals.
- Alimentary canal is complete with a well developed muscular pharynx. An excretory tube removes body wastes from the body cavity through the excretory pore.

- Sexes are separate (dioecious), i.e., males and females are distinct. Often females are longer than males. Fertilisation is internal and development may be direct (theyoung ones resemble the adult) or indirect.
- Examples: *Ascaris* (Round Worm), *Wuchereria* (Filaria worm), *Ancylostoma* (Hookworm).

PHYLUM-ANNELIDA

- They may be aquatic (marine and fresh water) or terrestrial; free-living, and sometimes parasitic.
- They exhibit organ-system level of body organisation and bilateral symmetry.
- They are triploblastic, metamerically segmented and coelomate animals. Their body surface is distinctly marked out into segments or metameres (Latin, annulus : little ring) and, hence, the phylum name Annelida .
- They possess longitudinal and circular muscles which help in locomotion. Aquatic annelids like *Nereis* possess lateral appendages, parapodia, which help in swimming.
- A closed circulatory system is present. Nephridia (sing. nephridium) help in osmoregulation and excretion. Neural system consists of paired ganglia (sing. ganglion) connected by lateral nerves to a double ventral nerve cord. *Nereis,* an aquatic form, is dioecious, but earthworms and leeches are monoeci ous.
- Reproduction is sexual.
- Examples: *Nereis, Pheretima* (Earthworm) and *Hirudinaria* **(Blood sucking leech).**

PHYLUM -ARTHROPODA

- This is the largest phylum ofAnimalia which includes insects. Over two-thirds of all named species on earth are arthropods. They have organ-system level of organisation.
  They are bilaterally symmetrical, triploblastic, **segmented and coelomate animals.**
- The body of arthropods is covered by chitinous exoskeleton. The body consists of head, thorax and abdomen. They have jointed appendages (arthros-joint, poda-appendages).
- Respiratory organs are gills, book gills, book lungs or tracheal system.
- Circulatory system is of open type.
- Sensory organs like antennae, eyes (compound and simple), statocysts or balance organs are present.
- Excretion takes place through rnalpighian tubules. They are mostly dioecious.
- Fertilisation is usually internal. They are mostly oviparous. Development may be direct or indirect.
- Examples: Economically important insects - *Apis* **(Honey** bee), *Bombyx* (Silkworm), *Laccifer* (Lac insect)
  Vectors - *Anopheles, Culex* and *Aedes* (Mosquitoes)
  Gregarious pest - *Locusta* (Locust)
  Living fossil - *Limulus* (King crab).

PHYLUM-MOLLUSCA

- This is the _second largest animal phylum. Molluscs are terrestrial or aquatic (marine or fresh water) having an organ-system level of organisation. They are bilaterally symmetrical, triploblastic and coelomate animals.
- Body is covered ,by a calcareous shell and is unsegmented with a distinct head, muscular foot and visceral hump.
- A soft and sporlgy layer of skin forms a mantle over the visceral hump. The space between the hump and the mantle is called the mantle cavity in which feather like gills are present. They have respiratory and excretory functions. The anterior head region has sensory tentacles. The mouth contains a file-like rasping organ for feeding, called radula.
- They are usually dioecious and oviparous with indirect development.
- Examples: Pila (Apple snail), Pinctada (Pearl oyster), Sepia (Cuttlefish), Loligo (Squid), Octopus (Devil fish), Aplysia (Seahare), Dentalium (Tusk shell) and Chaetopleura(Chiton).

PHYLUM -ECHINODERMATA

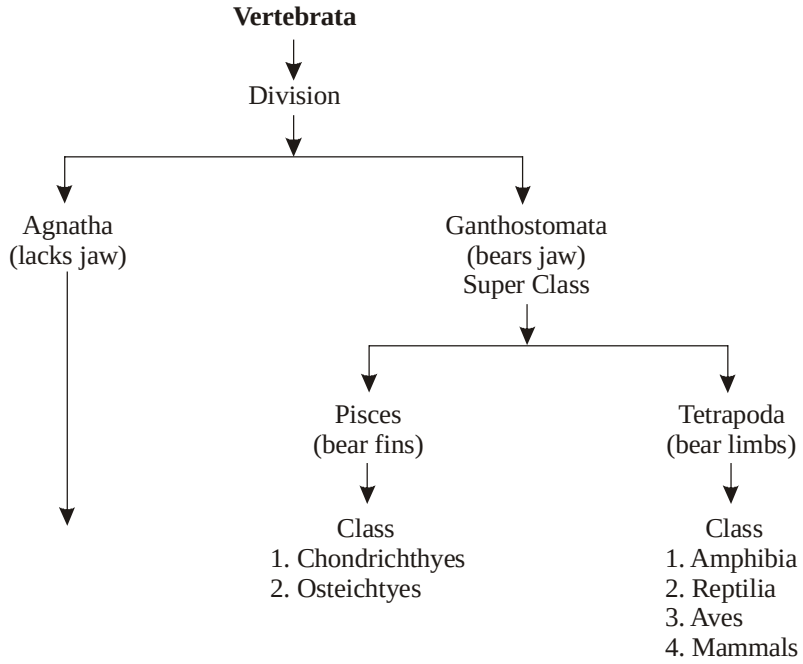
- These animals have an endoskeleton of calcareous ossicles .. and, hence, the name Echinodermata. All are marine with organ-system Jevel of organisation.
- The adult echinoderms are radially symmetrical but larvae are bilaterally symmetrical. They are triploblastic and coelomate animals.
- Digestive system is complete with mouth on the lower (ventral) side and anus on the upper (dorsal) side.
- The most distinctive feature of echinoderms is the presence of water vascular system which helps in locomotion, capture and transport of food and respiration. An excretory systeM is absent.
- Sexes are separate. 'Reproduction is sexual. Fertilisation is usually external. Development is indirect with free-swimming larva.
- Examples: *Asterias* (Star fish), *Echinus* (Sea urchin), *Antedon* (Sea lily), *Cucumaria* (Sea cucumber) and *Ophiura* (Brittle star).

PHYLUM-HEMICHORDATA

- Hemichordata was earlier considered as a sub-phylum under phylum Chordata. But now. it is placed as a separate phylum under non-chordata.
- This phylum consists of a small group of worm-like marine animals with organ-system level of organisation. They are bilaterally symmetrical, triploblastic and coelomate animals.
- The body is cylindrical and is composed of an anterior proboscis, a collar **and** a long trunk.
- Circulatory system is of open type. Respiration takes place through gills. Excretory organ is proboscis gland.
- Sexes are separate. Fertilisation is external. Development is indirect.
- Examples: *Balanoglossus* and *Saccoglossus.*

PHYLUM-CHORDATA

- Animals belonging to phylum Chordata are fundamentally characterised by the presence of a notochord, a dorsal hollow nerve cord and paired pharyngeal gill slits These are bilaterally symmetrical, triploblastic, coelomate with organ-system level of organisation. They possess a post anal tail and a closed circulatory system.
- Phylum Chordata is divided into three subphyla: Urochordata or Tunicata, Cephalochordata and Vertebrata.
- Subphyla Urochordata and Cephalochordata are often referred to as protochordates and are exclusively marine. In Urochordata, notochord is present only in larval tail, while in Cephalochordata, it extends from head to tail region and is persistent throughouth their life.
- Examples: Urochordata - *Ascidia, Salpa, Doliolum;* Cephalochordata - *Branchiostoma* (Amphioxus or Lancelet).
- The members of subphylum Vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult. Thus all vertebrates are chordates but all chordates are not vertebrates: Besides the basic chordate characters, vertebrates have a ventral muscular heart with two, three or four chambers, kidneys for excretion and bsmoregulation and paired appendages which may be fins or limbs.
  The subphylum Vertebrata is further divided as follows:



CLASS - CYCLOSTOMATA

- All living members of the class Cyclostomata are ectoparasiteS on some fishes. They have an elongated body bearing 6-15 pairs of gill slits for respiration.
- Cyclostomes have a sucking and circular niouth without jaws. Their body is devoid of **scales and paired** fins. Cranium and vertebral column are cartilaginous. Circulation is of closed type. Cyclostomacare marine but migrate for spawning to fresh water. After spawning, within a few days, they die. Their larvae, after metamorphosis, return to the ocean.
- Examples: *Petromyzon* (Lamprey) and *Myxine* (Hagfish)

CLASS, CHONDRICHTHYES

- They are marine animals with streamlined body and have cartilaginous endoskeleton. Mouth is located ventrally. Notochord is persistent throughout life. Gill slits are separate and without operculum (gill cover). The skin is tough, containing minute placoid scales. Teeth are modified placoid scales which are backwardly directed. Their jaws are very powerful. These animals ate predaceous. Due to the absence of air bladder, they have to swim constantly to avoid sinking.
- Heart is two-chambered (one auricle and one ventricle). Some ofthem have electric organs (e.g., *Torpedo)* and some possess poison sting (e.g., *Trygon).* They are cold-blooded (poikilothermous) animals, i.e., they lack the capacity to regulate their body temperature.
- Sexes are separate. In males pelvic **fins bear claspers.** They have internal fertilisation and many of them are viviparous.
- Examples: *Scoliodon* (Dog fish), *Pristis.* (Saw fish), *Carchurodon* (Great white shark), -*Trygon* (Sting ray).

CLASS - OSTEICHTHYES

- It includes both' marine and fresh water fishes with bony endoskeleton. Their body is streamlined. Mouth is mostly terminal.
- They have four pairs of gills which-are covered by an operculum on each side. Skin is covered with cycloid/etenoid scales. Air bladder is present which regulates buoyancy.
- Heart is two chambered (one auricle and one ventricle). They are cold-blooded animals.
- Sexes are separate. Fertilisation is usually external. They are mostly oviparous and development is direct.
- Examples: Marine - Exocoetus (Flying fish), Hippocampus (Sea horse); Freshwater - Labeo (Rohu), Catla (Katla), *Clarias* (Magur); *Aquarium* - Sena (Fighting fish), *Pterophyllum* (Angel fish).

CLASS - AM PHIBIA

- As the name indicates (Gr., Amplu : dual, trios, life), amphibians can live in aquatic as well as terrestrial habitats. Most of them have two pairs of limbs. Body is divisible into head and trunk. Tail may be present in some. The amphibian skin is moist (without scales). The eyes have eyelids. A tympanum represents the ear.
- Alimentary canal, urinary and reproductive tracts open into a common chamber called cloaca which opens to the exterior. Respiration is by gills, lungs and through skin. The heart is three chambered (two auricles and one ventricle). These are cold-bloc:led animals. Sexes are separate. Fertilisation is external. They are oviparous and development is direct or indirect.
- Examples: *Bufo* (Toad), *Rana* (Frog), *Hyla* (Tree frog), *Salamandra* (Salamander), *Ichthyopilis* (Limbless amphibia)

CLASS - REPTILIA

The class name refers to their creeping or crawling mode of locomotion (Latin, repere or reptum, to creep or crawl). They are mostly terrestrial animals and their body is covered by dry and cornified skin, epidermal scales or scutes . They do not have external ear openings.

- Heart is usually three-chambered, but four-chambered in crocodiles. Reptiles are poikilotherms. Snakes and lizards shed their scales as skin cast. Sexes are separate. Fertilisation is internal. They are oviparous and development is direct.
- Examples: Chelone (Turtle), Testudo (Tortoise), Chameleon (Tree lizard), Calotes (Garden lizard), Crocodilus (Crocodile), Alligator (Alligator). Hemidactylus (Wall lizard), Poisonous snakes - Naja (Cobra), Bangarus (Krait), Vipera (Viper).

CLASS -AVES

- The characteristic features of Aves (birds) are the presence of feathers and most of them can fly except flightless birds (e.g., Ostrich). They possess beak . The forelimbs are modified into wings. The hind limbs generally have scales and are modified for walking, swimming or clasping the tree branches. Skin is dry without glands except the oil gland at the base of the tail. Endoskeleton is fully ossified (bony) and the long bones are hollow with air cavities (pneumatic). The digestive tract of birds has additional chambers, the crop and gizzard.
- Heart is completely four chambered. They are warm-blooded (homoiothermous) animals, i.e., they are able to maintain a constant body temperature.
  Respiration is by lungs. Air sacs connected to lungs supplement respiration.
- Sexes are separate. Fertilisation is internal. They are oviparous and development is direct.
- Examples: Corvus (Crow), Columba (Pigeon), Psittacula (Parrot), Struthio (Ostrich), Pavo (Peacock), Aptenodytes (Penguin), Neophron (Vulture).

CLASS - MAMMALIA

- They are found in a variety of habitats - polar ice caps, deserts, mountains, forests, grassland ,.: and dark caves. Some of them have adapted-to fly or live in water. The most unique mammalian characteristic is the presence of milk producing glands (mammary glands) by which the young ones are nourished. They have two pairs of limbs, adapted for Walking, running, climbing, burrowing, swimming or flying . The skin of mammals is unique in possessing hair.
- External ears or pinnae are present. Different types of teeth are present in the jaw. Heart is four chambered. They are homoiothennous. Respiration is by lungs.
- Sexes are separate and fertilisation is internal. They are viviparous with few exceptions and development is direct.
- Examples: *Oviparous-Ornithorhynchus* (Platypus); Viviparous - *Macropus* (Kangaroo), *Pteropus* (Flying fox), *Catnelus* (Camel), *Macaca* (Monkey), *Rattus (Rat), Canis* (Dog), *Felis (Cat), Elephas* (Elephant), *Equus* (Horse), *Delphinus* (Common dolphin), *Balaenoptera* (Blue whale), *Panthera tigris* (Tiger), *Panthera* leo (Lion).
- **Salient features of different Phyla in the animal kingdom**

Phylum	Level of Organisation	Symmetry	Coelom	Segmentation	Digestive system	Circulatory System	Respiratory System	Distinctive Features
Porifera	Cellular	Many	Absent	Absent	Absent	Absent	Absent	Body with pores and canals in walls.
Coelenterata (Cnidaria)	Tissue	Radial	Absent	Absent	Incomplete	Absent	Absent	Cnidoblasts present.
Ctenophora	Tissue	Radial	Absent	Absent	Incomplete	Absent	Absent	Comb plates for locomotion.
Platyhelminthes	Organ & Organ system	Bilateral	Absent	Absent	Incomplete	Absent	Absent	Flat body, suckers.
Aschelminthes	Organ system	Bilateral	Pseudocoelomate	Absent	Complete	Absent	Absent	Often worm shaped, elongated.
Annelida	Organ system	Bilateral	Coelomate	Absent	Complete	Present	Present	Body segmentation like rings.
Arthropoda	Organ system	Bilateral	Coelomate	Absent	Complete	Present	Present	Exoskeleton of cuticle, jointed appendages.
Mollusca	Organ system	Bilateral	Coelomate	Absent	Complete	Present	Present	External skeleton shell usually present.
Echinodermata	Organ system	Radial	Coelomate	Absent	Complete	Present	Present	Water vascular system, radial symmetry.
Hemichordata	Organ system	Bilateral	Coelomate	Absent	Complete	Present	Present	Water vascular system, radial symmetry.
Chordata	Organ system	Bilateral	Coelomate	Present	Complete	Present	Present	Notochord, dorsal hollow nerve cord, gill slits with limbs or fins.

Note : • Defference between Chordates and Non-chordates

	Chordates	Non-chordates
1	Notochord present	Notochord absent
2	Central nervous system isdorsal, hollow and single.	Central nervous system is ventral, solid and double.
3	Pharynx perforated by gill slits.	Gill slits are absent.
4	Heart is ventral	Heart is dorsal (if present)
5	A post-anal part (tail) is present.	Post-anal tail is absent.

Animal Kingdom Exercise

Q1. The grade of organization in sponges is.

(A) Cellular grade

(B) Tissue grade

(C) Organ grade

(D) Organ system grade

Q2. The blind sac body plan is shown by.

(A) Sponges

(B) Cnidarians and flatworms

(C) Flatworms and roundworms

(D) Round worms and earthworms

Q3. Majority of adult sponges show.

(A) Asymmetry

(B) Radial symmetry

(C) Bilateral symmetry

(D) Biradial symmetry

Q4. Radial symmetry occurs in:

(A) Porifera and coelenterate

(B) Arthropoda and mollusca

(C) Coelenterata and echinodermata

(D) Coelenterate and platyhelminthes

Q5. How many germ layers are found in a ctenophore

(A) One

(B) Two

(C) Three

(D) Absent

Q6. Metamerism is characteristic of

(A) Porifera

(B) Mollusca

(C) Annelida

(D) Echinodermata

Q7. Coelom is a space between

(A) Splitted mesoderm

(B) Mesoderm and ectoderm

(C) Ectoderm and endoderm

(D) Mesoderm and body wall

Q8. Body cavity lined by mesoderm is

(A) Coelom

(B) Blastocoel

(C) Archenteron

(D) Coelenteron

Q9. The earthworms ,insects and snails are

(A) Protostomes

(B) Acoelomates

(C) Deuterostomes

(D) Pseudocoelomates

Q10. Which of the following groups is deuterostome?

(A) Annelida, mollusca, chordate

(B) Annelida, Arthropoda, Mollusca

(C) Arthropoda, Mollusca, Echinodermata

(D) Echinodermata, Hemichordata, chordate

Q11. Coelomate animal in which blastopore develops into anus is called

(A) Protostomia

(B) Deuterostomia

(C) Blastostomia

(D) None of these

Q12. A pseudocoel is found in

(A) Ascaris

(B) Earthworms

(C) Fasciola

(D) Hydra

Q13. Which is not correctly matched?

(A) Annelida – Enterocoelomate

(B) Arthropoda- schizocoelomate

(C) Plattyhelminthes- acoelomate

(D) Nemethelminthes- pseudocoelomate

Q14. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?

(A) Sponges

(B) Ctenophores

(C) Coelenterates(cnidarians)

(D) Aschelminthes (round worms)

Q15. Which structure in a sponges corresponds to mouth of other animals:

(A) Ostium

(B) Osculum

(C) Incurrent canal

(D) Ex-current canal

Q16. Most important character of all sponges is

(A) Choanocytes

(B) Coelenteron

(C) Herbivorous nutrition

(D) Only sexual reproduction

Q17. Which of the following pairs is not correctly matched?

(A) Osculum-control of water entry

(B) Spicules-Skeletal supporting element

(C) Amoebocytes-Transport food to non feeding cells

(D) Collar cells-movement of water and filtering food

Q18. The pathway of entering and coming out of water in sponges is:

(A) Canal system

(B) Feeding current

(C) Ambulacral system

(D) Water vascular system

Q19. Classification of sponges is primarily based:

(A) Body plan

(B) Skeleton

(C) Canal system

(D) Body organization

Q20. Euplectella is a

(A) Limy sponge

(B) Glass sponge

(C) Boring sponge

(D) Freshwater sponge

Q21. Cnidarians are characterized by

(A) Skeleton

(B) Aquatic habit

(C) Stinging cells

(D) Intracellular digestion

Q22. Metagenesis occurs in

(A) Hydra

(B) Obelia

(C) Aurelia

(D) Tubipora

Q23. Corals belong to the phylum

(A) Porifera

(B) Cnidaria

(C) Annelida

(D) Mollusca

Q24. Hypnotoxin is a poisonous fluid produced by

(A) Ants

(B) Ascaris

(C) Nematocysts

(D) Parasitic protozoa

Q25. Type of asexual reproduction found in Hydra is Budding

(A) Multiple fission

(B) Sporulation

(C) Binary fission

(D) Gemmule formation

Q26. Which of the following is without tentacles?

(A) Beroe

(B) Hydra

(C) Ctenoplana

(D) Pleurobrachia

Q27. Colloblasts are adhesive and sensory cells found in:

(A) Mollusca

(B) Ctenophora

(C) Echinodermata

(D) Platyhelminthes

Q28. Ctenophores have similarities with members of:

(A) Porifera

(B) Annelida

(C) Coelenterata

(D) Arthropoda

Q29. Flatworms are:

(A) Coelomates

(B) Acoelomates

(C) Pseudocoelomates

(D) None of these

Q30. Flame cells are associated with:

(A) Excretion

(B) Nutrition

(C) Respiration

(D) Digestion

Q31. What is common amongst tapeworm, liver fluke and planarian?

(A) They are all segmented

(B) They all have a coelom

(C) They are all found in gut

(D) They all have flattened body

Q32. Turbellarians are:

(A) Parasitic nematodes

(B) Free living flatworms

(C) Parasitic flatworms

(D) Free living nematodes

Q33. Fasciola hepatica is present in:

(A) Liver of sheep

(B) Blood of sheep

(C) Spleen of sheep

(D) Intestine of sheep

Q34. Roundworms differ from flatworms in having a:

(A) Pseudocoel

(B) Dorsal nerve cord

(C) Circulatory system

(D) Circular muscular layer

Q35. Filariasis is caused by:

(A) Taenia solium

(B) Ascaris lumbricoides

(C) Fasciola hepatica

(D) Wuchereria bancrofti

Q36. From the following ,a monogenetic parasite is

(A) Taenia solium

(B) Ascaris

(C) Fasciola hepatica

(D) Plasmodium vivax

Q37. Guinea worm is a parasite in man which invades:

(A) Small intestine

(B) Lymphatic vessel

(C) Colon rectum

(D) Subcutaneous connective tissue

Q38. Organism having bilateral symmetry, closed circulatory system and metameric segmentation belong to:

(A) Annelida

(B) Mollusca

(C) Arthropoda

(D) Echinodermata

Q39. Which of the following is correct matching related to locomotion?

(A) Leech-Setae

(B) Earthworm-clitellum

(C) Nereis-parapodia

(D) Starfish-pedicellaria

Q40. The gas exchange in an earthworm is:

(A) Skin

(B) Gills

(C) Ctenidia

(D) Tracheae

Q41. Earthworms are friends of farmers because

(A) Sixteen earthworm develop

(B) They eat bacteria

(C) They are bait for fish catching

(D) None of the above

Q42. A definite number of body segments is found in:

(A) Slug

(B) Leech

(C) Earthworm

(D) tapeworm

Q43. Biggest phylum with reference to number of species is:

(A) Pisces

(B) Insecta

(C) Mollusca

(D) Arthropoda

Q44. Which of the following pigments, is present in the blood of some arthropods?

(A) Haemoglobin

(B) Chlorophyll

(C) Haemocyanin

(D) All of these

Q45. Which of the following is the connecting link?

(A) Pila

(B) Limulus

(C) Periplanata

(D) Periplatus

Q46. Respiration in crustacea is carried out by:

(A) Gills

(B) Tracheae

(C) Book-lungs

(D) All of these

Q47. Diagnostic feature of insect is:

(A) Three pairs of legs

(B) Compound eyes

(C) Two pairs of wings

(D) Chitinous body

Q48. The excretory organs in cockroach and other insects are:

(A) Green glands

(B) Antennal glands

(C) Metanephridia

(D) Malpighian tubules

(E) Malpighian corpuscles

Q49. A file-like rasping organ for feeding in mollusca is:

(A) Tongue

(B) Radula

(C) Osphradium

(D) Dental plate

Q50. Many molluscs have a water-testing organ present in the mental cavity. This is called:

(A) Ctenidium gills

(B) Statocyst

(C) Osphradium

(D) Nematocyst

Q51. In mollusca ,the shell is secreted by:

(A) Mantle

(B) Foot

(C) Ctenidium

(D) Pericardium

Q52. Neopilina is a connecting link between:

(A) Annelida and mollusca

(B) Arthropoda and mollusca

(C) Mollusca and platyhelminthes

(D) Mollusca and echinodermata

Q53. Pearl producing Indian species is:

(A) Unio

(B) Cypraea

(C) Cuttle fish

(D) Pinctada vulgaris

Q54. In which class of the phylum mollusca,octopus is included?

(A) Gastropoda

(B) Pelecypoda

(C) Cephalopoda

(D) Scaphopoda

Q55. Which of the following is characteristic of the phylum echinodermata ?

(A) Metameric , enterocoelic, pentamerous

(B) Triploblastic, coelomate, pentamerous

(C) Diploblastic, enterocoelic, pentamerous

(D) Freshwater, eucoelomate, radially symmetrical

Q56. One feature exclusive to Echinodermata is:

(A) Eye spots

(B) Radial symmetry

(C) Neurosensory cells

(D) Water vascular system

Q57. Tube feet are characteristic structures of:

(A) Star fish

(B) Cuttle fish

(C) Cray fish

(D) Jelly fish

Q58. Which is the common ancestral larval form of echinoderms, hemichordates and chordates?

(A) Tornaria

(B) Dipleurula

(C) Bipinnaria

(D) Trochophore

Q59. Balanoglossus belongs to the group

(A) Annelida

(B) Hemichordate

(C) Platyhelminthes

(D) Cephalochordata

Q60. Stomatochord is found in :

(A) Urochordata

(B) Hemichordate

(C) Cephalochordate

(D) Both a and b

Q61. Proboscis gland in Balanoglossus is associated with:

(A) Excretion

(B) Digestion

(C) Respiration

(D) Circulation

(E) Reproduction

Q62. Characters of which group are present in all chordates in some stages or the other of their life cycle?

(A)Mammary glands, hairs and gill clefts

(B) Gill clefts ,vertebral column and notochord

(C) Notochord, scales and dorsal tubular nervous system

(D) Notochord, gill clefts and dorsal tubular central nervous system

Q63. Which of the following statement Is true?

(A) All chordates are vertebrates

(B)All vertebrates are chordates

(C)Non-chordates have a vertebral column

(D)Invertebrates posses a tubular nerve cord

Q64. Retrogressive metamorphosis takes place in :

(A) Reptiles

(B) Annelids

(C) Urochordata

(D) Cephalochordata

Q65. Amphioxus belongs to:

(A) vertebrata

(B) urochordata

(C) cephalochordata

(D) Hemichordata

Q66. Which of the following statement is not true for Agnatha?

(A)They have notochord throughout their lives

(B)They include hagfishes and lampreys

(C)They are known as cyclostomes

(D)They have bony skeletons

Q67. The larva of petromyzon is known as :

(A) Axolotl

(B)Tornaria

(C) Bipinnaria

(D) Ammocoete

Q68. Two-chambered heart is a feature of:

(A)Birds

(B) Fishes

(C)Reptiles

(D)Mammals

(E)Amphibians

Q69. Cartilaginous fishes do not have

(A) Scales

(B)Gill-slits

(C) Pelvic fins

(D) Operculum

Q70. Which of the following scales are similar to mammalian teeth?

(A) Cycloid

(B) Placoid

(C) Ganoid

(D)Ctenoid

Q71. Bony fishes differ from shark in that:

(A)Bony fishes have caudal fin

(B)Bony fishes have operculum

(C)Bony fishes have scales

(D)None of the above

Q72. The generic name of the 'flying fish' is:

(A) Pristis

(B)Torpedo

(C) Exocoetus

(D)Hippocampus

Q73. Which one is not an amphibian?

(A) Toad

(B) Frog

(C)Tortoise

(D) Salamander

Q74. Gymnophiona are:

(A) Tailless with long legs

(B) Vermiform without limbs

(C) Extinct with massive endoskeleton

(D) Scaleless with a well developed tail

Q75. Which one of the following has 3 chambered heart?

(A) Salamander

(B) Fish

(C) Crocodile

(D) Tortoise

Q76. Retention of larval characters even after sexual maturity is called:

(A) Neoteny

(B) Paedogenesis

(C) Metagenesis

(D) Parthenogenesis

Q77. Common Indian bull frog is:

(A) Rana tigrina

(B) Rana esculenta

(C) Rana silvatica

(D) Rana cyanophlyctis

Q78. The heart is 3 or 4 chambered in the vertebrate group:

(A) Fishes

(B) Aves

(C) Reptilia

(D) Amphibian

Q79. A true terrestrial animal is:

(A) Frog

(B) Toad

(C) Tortoise

(D) Necturus

Q80. Name of reptile with a third eye :

(A) Naja

(B) Bangarus

(C) Ophiosaurus

(D) Sphenodon

Q81. Which one of the following is poisonous?

(A) Python

(B) Typhlops

(C) Heloderma

(D) Hemidactylus

Q82. Venom of viper effects:

(A) Nervous system

(B) Circulatory system

(C) Respiratory system

(D) None of these

Q83. Preen glands occurs in :

(A) Aves

(B) Pisces

(C) Reptiles

(D) Mammals

Q84. Archaeopteryx is the connecting link between:

(A) Reptiles and Aves

(B) Aves and Mammals

(C) Fishes and Amphibians

(D) Amphibians and Reptiles

Q85. The most important feature of class Aves is:

(A) Four chambered heart

(B) Presence of tail

(C) Thermal regulation

(D) Exoskeleton of feathers

Q86. The largest egg belongs to:

(A) Elephant

(B) Whale

(C) Dinosaur

(D) Ostrich

Q87. Characteristics of mammals without exception:

(A) Viviparity

(B) Mammary gland

(C) Heterodont teeth

(D) Hair all over the body

Q88. Mammary glands are without teats(nipples)in:

(A) Aves

(B) Eutheria

(C) Prototheria

(D) Metatheria

Q89. Mammalian red blood cells has

(A) No nucleus

(B) Many nuclei

(C) Single nucleus

(D) Beaded nucleus

Q90. Pouched mammals are:

(A) Eutherians

(B) Metatherians

(C) Prototherians

(D) None of these

Q91. Placenta is universally present in:

(A) Reptiles

(B) Aves

(C) Prototheria

(D) Eutheria

Q92. Common feature of whale, bat and rat:

(A) Absence of neck

(B) Presence of External ears

(C) Extra abdominal testis to avoid higher temperature of body

(D) Presence of muscular diaphragm between thorax and abdomen

Q93. Corpus callosum occurs in the brain of:

(A) Pigeon

(B) Crocodile

(C) Elephant

(D) Ornithorhynchus